

isolation. Rather, “[a]nticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, *arranged as in the claim*.” *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481,485 (Fed. Cir. 1984). Thus, even if the prior art reference includes all of the elements that are claimed, if the arrangement of the claimed elements is different from the arrangement of the prior art elements, anticipation will not be present. Further, anticipation will not be found when the prior art is lacking or missing a specific feature or structure of the claimed invention. Finally, regarding inherency, “[i]nherency...may not be established by probabilities or possibilities. The mere fact that a certain thing *may* result from a given set of circumstances is not sufficient.” *In re Oelrich*, 666 F.2d 578, 581, 212 USPQ 323, 326 (C.C.P.A. 1981). That is, a missing element or function must *necessarily* result from the prior art reference. Furthermore, regarding teaching or disclosing, the description must enable a person with ordinary skill in the art not only to comprehend the invention, but also to make it. *In re Wilder*, 429 F. 2d 477, 166 USPQ 545 (C.C.P.A. 1970).

Regarding Claim 1

Claim 1 claims, in part, “wherein each individual diode region has an independently selectable depth including an ion-implanted portion.” (emphasis added)

The Examiner stated, regarding Claim 1, that the Seabaugh (‘860), in Figure 13, discloses the depth of the diode, for example, the base epilayer 216 is deposited to a thickness of 0.08 microns. The Examiner asserted that the constant thickness construes the independence depth of the diode. In addition, the Examiner asserted elements 230 are clearly co-planar with layer 220, since the top surfaces of these elements have the same height, see Figure 13.

The Applicant has thoroughly reviewed the patent by Seabaugh (‘860), and could find no basis for the Examiner’s assertion that Seabaugh (‘860) discloses diode regions having independently selectable depth, either in terms of ion implantation depth or physical depth. Further, the Applicant does not understand how the Examiner has interpreted the Seabaugh (‘860) such that the constant thickness of the base epilayer 216 construes the independence depth of the diode.

The Applicant has arrived at this conclusion not only after a thorough review of this patent, but also after a word search of the text of the patent using keywords including “independent,” which yielded one occurrence at column 3, line 53-54; “doped,” which yielded five occurrences in the paragraph beginning at column 5, line 9 and one
5 occurrence in the paragraph beginning at column 6, line 43; “thick,” which yielded five occurrences in the paragraph beginning at column 5, line 9 and three occurrences in the paragraph beginning at column 5, line 43; and “etch,” which yielded three occurrences in the paragraph beginning at column 5, line 43. No where in the patent did the Applicant find any combination of these terms or of any similar terms that would indicate that this
10 feature is taught by Seabaugh ('860).

Rather, the diodes of Seabaugh ('860) are fabricated by ordinary semiconductor fabrication means. The focus of the invention of Seabaugh ('860) is the provision of multi-finger (either base or emitter) transistors that provide a set of resonant tunneling diodes that each switch at a different voltage. Contrary to the Examiner's assertion, the
15 invention of Seabaugh ('860) does not contain any mention of ion implantation. This is different from the present invention, which provides a plurality of diodes, each having an independently tailorable current-voltage characteristic, and where the mechanism for providing this independence is either an independently selectable ion implant depth or an independently selectable physical depth, as depicted clearly in FIGs. 2 and 3
20 (respectively) of the present application.

Because Seabaugh ('860) does not teach this feature of the present invention, either expressly or inherently, the Seabaugh ('860) fails to provide (1) a single reference (2) that teaches or enables (3) each of the claimed elements (as arranged in the claim) (4) either expressly or inherently and (5) as interpreted by one of ordinary skill in the art.
25 Thus, the Applicant respectfully requests that the Examiner withdraw this rejection of Claim 1.

Regarding Claim 2

Regarding Claim 2, the Examiner stated that Seabaugh ('860) further discloses the
30 diode region being formed as a resonant tunneling diode region, referring to the Abstract.